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Feature Story

Each month we'll provide a feature article on key industry trends and developments. Authored by a member of Intel's Executive Staff, you'll find insightful and useful information for product development, planning and execution.

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On behalf of all of us at Platform Solutions, welcome to the future of the PC platform!

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Feature

On Track With Intel's Platform Initiatives

By Dan Russell
Director of Platform Marketing
Intel Corporation

Intel's platform enabling efforts are focused on five broad initiatives designed to advance the performance and capabilities of the PC platform. Here's a closer look at the status of these initiatives moving into 1999.

Moving PC platform technology forward is a constantly evolving process that must stay closely aligned with the key issues facing the industry today. As part of its ongoing efforts to enable new platform technologies and capabilities, Intel is actively pursuing five major Initiatives as we move into 1999—Visual Computing, Wired for Management (WfM), PC Ease of Use, PC Security, and Broadband Communications.

Visual Computing

In the Visual Computing arena, Intel is focused on enabling the development of 3-D visualization, content convergence, and built-in flat panel display technologies.

3-D visualization activities have centered around the evolution of AGP technology, with version 2.0 of the specification announced in 1998. AGP 4X devices are slated for introduction in 1999 with the ability to support bus clock speeds up to 266 MHz. These developments have been supported by the availability of several Intel® Performance Evaluation and Analysis Kit (IPEAK) tool sets, including the Graphics Performance Toolkit and the Baseline AGP System Evaluation Suite.

Content convergence saw notable developments in 1998, particularly in the widespread adoption of DVD technology. Today, virtually every PC manufacturer is shipping Pentium® II processor-based desktop PCs with DVD-ROM drives, and all of the major Hollywood studios support, or have announced support for, DVD technology. In addition, over 250 DVD-ROM interactive software titles are shipping or are in development. A host of Intel sponsored DVD Plugfest events have resulted in dramatic improvements in DVD interoperability. Moving into 1999, ongoing work on two future DVD formats—DVD-Audio and DVD-RAM—is progressing well.

In flat panel display news, Intel formed a Digital Display Working Group (DDWG) with Compaq, Dell, Fujitsu, HP, IBM, Microsoft, NEC, and Silicon Image during 1998. The group is chartered with driving a single widely accepted specification that will enable manufacturers to deliver robust, comprehensive and expandable interfaces for digital display, adding external plug and play and higher performance compared to traditional analog technology.

Wired for Management

The WfM Initiative made great progress in 1998, with more than 40 manufacturers shipping products that support the WfM Baseline v1.1. WfM Baseline v2.0 was also introduced in mid-1998 adding a host of new IT benefits to the specification. WfM Baseline v2.0 enhances the four basic management capabilities addressed in v1.1 and also includes an improved architecture for the Pre-Boot eXecution Environment (PXE), Wake-on-LAN capabilities for off hours maintenance, and Advanced Configuration and Power Interface (ACPI) power reduction enhancements.

The new specification augments support for the Desktop Management Interface (DMI) with support for the newer Common Information Model (CIM), paving the way for Web-based Enterprise Management (WBEM) via WfM-enabled systems. Initial WfM v2.0-enabled products are slated to appear in the first half of 1999, with volume shipments following.

PC Ease of Use

Intel's Instantly Available PC (IAPC) technology is leading a shift in the PC power-management scheme. IAPC accelerates resume times, enables communications to be retained while a computer is in the sleeping state, thus allowing it to wake-up quickly on demand. Based on open specifications, IAPC has enjoyed wide industry adoption, with IAPC-compliant systems expected to be available in the first half of 1999.

Legacy reduction and removal is another key focus of the PC Ease of Use Initiative. This encompasses external plug-and-play technologies such as USB and 1394, and examines how ISA and some super I/O functions can be removed to save on manufacturing and support costs while improving performance and reliability. During 1998, Intel built legacy-reduced concept PC platforms to demonstrate that the possibility of unique, easy to use, PC design is here today. Legacy reduction received another boost with the widespread adoption of Audio Codec '97, as well as the new Audio Modem Riser (AMR) system specification.

PC Security

One of Intel's newer Initiatives—PC Security—has been focused on the development of a specification for Digital Transmission Content Protection (DTCP). Working in conjunction with four leading consumer electronics companies (Toshiba, Hitachi, Matsushita, and Sony) Intel is focusing on defining authentication and encryption mechanisms capable of working over 1394, or any other digital bus, to provide content protection for high value content for PCs. Version 0.9 of the DTCP specification is available now, with more work on it and other PC Security technologies slated for 1999.

Broadband Communications

Intel's Broadband Initiative centers on increasing the bandwidth for video, voice and data communications to the PC, paving the way for better and faster connections that allow consumers to receive exciting digital content from anywhere in the world. Intel is advocating the development of a broadband infrastructure by investing in various transports including cable, Digital Subscriber Lines (DSLs), and satellite. Intel is working with the communications industry to define a complete architecture that enables such broadband applications as digital coupons, datacasting and electronic magazines.

Stay Tuned in 1999...

By any estimation, great progress was made in 1998 across the five broad Initiatives that comprise Intel's platform enabling efforts. As we move into 1999, plans call for continued work in each of these areas, helping computer manufacturers, silicon manufacturers and other platform developers, increase the performance and functionality of their next-generation products. Stay tuned to Platform Solutions News for the latest developments throughout the year.

About the Author:

Dan Russell is Intel's Director of Platform Marketing, where he is responsible for driving Intel's platform strategy and technology initiatives.

For More Information:

Platform Solutions PC Ease of Use top stories—

- [Ease-of-Use: a Challenge for the Industry](#), by Gerald Holzhammer
- [Ease-of-Use Starts with Legacy Removal](#), by Jim Valerio
- [Concept Platform Accelerates Legacy Removal at IDF](#)

DVD Technology—

- Intel's [DVD technology page](#) in *Platform Solutions*

Instantly Available PC technology—

- Intel's [IAPC technology Web site](#)

Wired for Management—

- [WfM Baseline v2.0 Extends PC Management Capabilities](#), by Steve Tolopka
- Intel's [WfM developer Web site](#)

Broadband Communications—

- [The Need for Speed on the Internet](#), by Kevin Kahn
- [Intel Architecture Labs Broadband Initiative Web site](#)

Special Comdex Review

Intel's Initiative Demos

By Tim Mostad
Senior Technical Marketing Manager

Come "Behind the Scenes" for an editorial overview of the Intel® technology demos at Fall Comdex. From purple dinosaurs to home networks, see which of these new technologies are ready for prime time—and which may need a little more work.

To paraphrase the great science fiction writer Isaac Asimov, "Any technology, sufficiently advanced, is indistinguishable from magic." Ahhhh—magic... that is exactly what any Technical Marketing Engineer is trying to create when developing a demo. The question is whether the technology is "sufficiently advanced" to enable demo magic? Our TMEs and technologies were put to the test at the recent Intel Comdex Technology Initiatives Suite. The results? Some magic—some not. We think you will find why we sometimes fail almost as interesting as how we succeed.

Legacy Removal

Talk about a technology arena that could use some magic. How about the beige box with a bazillion cables? While a competing computer architecture has been making waves with their "simple new system," that impact will pale when compared to the bold changes we envision to the staple architecture that serves 95 percent of computer consumers. One glimpse was provided by the concept PC demonstrated at Comdex.

This low-cost, high-performance PC is built from industry-standard components, USB, 1394, Instantly Available power management—and just about nothing else. Gone are legacy interconnects such as the com and line printer ports, and the PCI and ISA buses. The functionality of these devices has been replaced by easy-to-attach—and easy-to-use—USB and 1394 peripherals. The demo itself focused on the "OBE," or "Out of the Box Experience."

Simply put, you bring your PC home and plug it into the wall. While the PC is booting, you can attach a full complement of USB peripherals—including keyboard, mouse, monitor, speakers, modem, printer/scanner, and more. The operating system auto-detects these devices in real time and loads the drivers on the fly. In just a few minutes, you are ready to roll with a fully equipped and functional PC. Multiple futuristic chassis were shown which the staff in the suite affectionately named the "rabbit," the "twister," the "pyramid," and our favorite, the "fish"—a blue football-shaped device with fluorescent green imbedded speakers resembling bubbles and a DVD ROM player as a mouth. Why not show-off designer PCs? After all, the toilet and the PC are about the only two household fixtures whose appearances have not changed over the last 20 years. This was probably the most "magical" technology offered within the suite.

Digital + Video Broadcast

The idea behind this new technology is that an ATSC (not NTSC) MPEG-2 transport stream is beamed to your home, where it is picked up by your rabbit-ear or rooftop antenna. This stream is then sent to your PC where it is picked up by a bundled DTV tuner card and sent to a Pentium® II processor with Katmai New Instructions. The processor decodes the stream into video and audio that can be viewed on the fly, in addition to a data portion that is saved to your HDD for later viewing. Once viewed, the portion on your HDD looks a lot like an interactive Web page with music, panoramic views of architectural structures and video clips.

The plan appears to involve eventually moving this functionality to a set-top box. A set-top PC? Maybe, but I don't watch TV on my PC. What I want is a way for me to watch TV on my TV (surprise) and in the background I want my Katmai-enabled PC to decode and save the digital content for later browsing. For example, this could be a mission of a Star Trek game that parallels what I just saw on the TV. Now that would be exciting! However, to do this I would have to run a wire from my TV through my living room from my PC and that would excite my wife....

Connected Home Technologies

OK, good, there's hope to preserve my happy home. This demo was actually three demos in one. Its purpose was to show broadband (DSL, cable, or satellite) Internet access networked throughout the home via telephone lines and radio waves. As Dave Ryan, the general manager of Intel Architecture Labs pointed out, the goal of the "Anywhere In The Home" project is to provide robust home networking using two media that all homes have today—phone lines and air. The phone networking side of the demo was accomplished via the 21145 component announced by Intel, allowing 1-Mb TCP/IP networking over twisted pair phone lines. The demo showed how a single point of broadband Internet access could be shared throughout the home by all PCs with their 21145 PCI cards plugged into a phone jack.

The RF portion of the demo broadened the scope of the home network even further. A single point of RF access provided 1-Mb networking to computers and CE devices not attached to a telephone jack. We demonstrated a pen-based computer used to simulate a touch pad that might exist in the kitchen, allowing wireless Web browsing and network access to other machines in the home. I can buy into this vision, provided we solve the problem of having to leave my PC on 24 hours a day, 365 and a quarter days a year, to act as the central hub in the network. Well actually, I do that right now, for lack of a choice, but my contribution to the rising world energy consumption simply wears on my conscience.

Instantly Available PC: Wake-Up On Barney

Oh good, now I can pursue my quest to harness cosmic background energy at a more rational pace. Intel's vision of power management, an Instantly Available PC was shown waking up in response to the squeeze of a Barney doll's hand. Squeezing the doll's hand woke the PC from the ACPI defined S3, or "Suspend to RAM" (sub 5 watt) sleep state in about 5 seconds. Once awake, the doll and the PC software began singing the "Imagination Island" theme song together. The doll and the PC communicated via a RF antenna that connects to the PC's MIDI port. The idea of the demo was to show just how easy and user friendly it can be to access and operate an Instantly Available PC.

If you were able to make it through the demo without ripping the head off the purple singing dinosaur, you might have noticed a few things. First, this long-awaited power-management technology is pretty cool. Secondly, with the exception of the 5 second "Off" to "On" capabilities of the Instantly Available PC, the demo was "magic." Not the kind of magic I was talking about before, but the kind that you have when you realize that sawing a person in half would make a much bigger mess than you see on stage. By which I mean this demo, too, was faked. The truth behind the wake-up lies in a noise detection circuit much like the infamous "Clapper" of the early 1980's. A hidden microphone inside the doll triggers a press of the power button (one of several ways to awaken an Instantly Available PC). The Instantly Available PC will be fine, until we have a few more ways to wake up PCs externally, such as from USB and home network cards ("Clap on...Clap off..."). Then I will keep on clapping, because more PCs won't necessarily mean more power consumed.

USB ADSL Modem

"It slices, it dices, it makes Julianne fries...." The problem was that nobody knew what Julianne fries were! Well, we now have a home ADSL solution for all you consumers who are tired of the clunky splitter required for home DSL, and the hassles of opening the case to add in a LAN card to benefit from the super-fast speeds of DSL service." I can just hear Walter Cronkite selling this one. And aren't you relieved that we have this solved?

The truth is that ADSL access is so rare today that the benefits displayed in this demo are nearly lost on almost anyone. The point here is that this is an area where Intel is working to simplify the technology for the user—long, long before users have had the chance to get confused. Instead, with a USB ADSL modem, the set-up process is as simple as attaching a telephone cord to one end of the modem and plugging in the only other cable on the device into a USB slot.

Are USB ADSL modems easy to use? I'm sure they would be if commercial versions existed, but service remains available only in selected areas. And it is expensive (for now). Is USB crucial technology for enabling fast adoption of ADSL in the home? Absolutely. But first they have to bring the price of DSL service down—and provide it in my neighborhood. Then they can sign me up!

Soft ADSL Modem

Now here's where it gets confusing—two generations of ADSL modems (software and hardware, i.e., USB) in the same showcase at the same time, and neither one of them commercially available. Typically software-based capabilities follow somewhat later to enable hardware cost reduction. It looks as if our Intel Architecture Labs cousins are outdating our own technology before it even leaves the gate. Furthermore, to make their magic they had to connect to an internal PCI modem, which confuses some of our fledgling ease-of-use messages. The user still simply plugs the phone line into the modem, but the case must be opened and a free PCI slot must be accessed. We have some work to do to sort this out so that the right implementation hits at the right time. But don't be confused, broadband is picking up a lot of momentum. So if you can offer me 1.5 Mbs downstream and 256 Kbs upstream Internet access and make it cheap, you can sign me up—and I really mean it this time!

Wired for Management 2.0

Let's face it, not all demos can be hair-raising barn-busters. Some technologies are simply a bit more...how shall I say, practical. The Wired for Management (WfM) 2.0 demo showcased three technologies: PXE 1.0 (Pre-boot eXecutionary Environment), DMI -> CIM mapper, and PRS (Problem Resolution Software). In the demo, a mobile client was first shown booting to a PXE server and remote-booting an operating system. This CardBus implementation of PXE 1.0 is a first for a mobile platform. Next up was a CIM application reading DMI information from a remote platform. And finally, those still awake saw a demonstration of the Problem Resolution Software Developers' Kit, a tool that enables helpdesk vendors to share information in a common format, using SIS/SES standards defined by the DMTF and CSC. Boy! More TLAs (Three Letter Acronyms) than you can shake a stick at! The bottom line, although this is crucial in the business/management environment, is that I would hate to have the job of the guy responsible for increasingly snazzier WfM demos.

OK, you can relax! I'm just messing with you. You did a great job! (Did I mention TMEs get a little passionate about their demos and technologies?)

AMR/AC'97

This demo showed the repartitioning of the digital and analog sections of the audio and modem functions in a Basic PC. This solution provides card manufacturers with a low pin-count digital interface, simplifying the interconnect with the chipset and isolating the analog codec from the noisy digital environment. This results in overall higher performance.

The system was based on the Intel® Damascus motherboard incorporating a 300/66-MHz Pentium® II Celeron™ processor, an Intel® 440EX AGPset, and an engineering sample of an AC'97 controller with the audio/modem combined codec implemented on the Audio/Modem Riser module. The demo featured live Internet feeds of news, sports and/or entertainment clips, using the Real Player* network application. Wow. You can be sure that this demonstration of Internet browsing left viewers stunned. Not. Get real, Web-browsing demos haven't turned heads at Comdex since about 1988. Seriously though, the merit of this demo was not in what was displayed on the screen. What is exciting is the fact that a combined sound card and V.90 modem designed around the AC'97 and AMR Specifications could retail for as low as \$15 (which purchased separately might cost as much as \$80). In an era when exciting new PC technologies die daily because they add a whole \$1 to the cost of the platform, this approximate \$79 system cost reduction opportunity is sure to get noticed.

Policy-Based Network Management (PBNM)

The PBNM demo was the largest of the group, and it needs a bit of explaining. Basically, PBNM allows network managers to set policy across a heterogeneous network. Makes sense to me. What it boils down to is, assume you have a network of routers, switches, and hubs from multiple manufacturers. PBNM provides a structure for performing such tasks as multi-casting across the network. In addition, PBNM enables the network manager to dedicate bandwidth across the network at predefined times to ensure uninterrupted video and audio streaming.

How good was the demo? Visually it was impressive, certainly in terms of scale. It took up almost three kiosks. The networking folks who saw the demo thought it was the best thing since sliced bread. And I certainly trust their judgment. As for me, I learned that multi-casting meant more than just a good fishing trip....

Computer Enhanced Telephony

Here's a demo that might take you back to the good old days of TAPI. (Missed that? Was that *you* on that fishing trip with me?) The Computer Enhanced Telephony demo used the Telephony API co-developed by Intel's Architecture Labs. The demo showed how computers can be instructed via a voice command to transmit their IP addresses to each other, and establish a connection, while voice communication is going on over the phone. It demonstrated the usefulness of a speech-enabled interface, and it showed how peer-to-peer Internet-based communication can enhance a public-switched telephone network phone call.

There are benefits associated with security and ease of use, and it makes setting up a "net meeting" a breeze, but let's face it, the real gold here is in on-line gaming. Call up your friend on the telephone, tell your computer to collaborate (like "big brother," it too is listening!), and *voila*, IP connection established. You are happily committing unspeakable horrors in cyberspace in no time! No more need for fancy Internet tools to help locate your ever-changing IP addresses. Sure it's great for securing on-line communications, but as you might predict by now, I want to have some fun with this thing.

1394 Video Capture to DVD RAM

This demo showed digital video that was captured with 1394 Video Capture Technology from Intel being encoded into MPEG-2 and written out to a DVD RAM disk. Interestingly enough, none of these things actually occurred during the demo. The problem of course, is that these things take time (even with a lightning-fast Katmai-based machine), and time is the one thing your customers don't have at Comdex. So what you saw wasn't exactly what you got (although it was close).

What you got was an AVI file already on the HDD of the computer. This file was copied to the DVD RAM medium. The Type 2 DVD RAM disk (single-sided) was then removed from its native cartridge and placed in one of a new breed of DVD ROM drives. This Panasonic drive was no ordinary DVD ROM drive—it was capable of reading DVD RAM disks. (Given the hopefully temporary confusion in the DVD standards space, this definitely qualifies as magic.) In this way a movie copied using a DVD RAM player can be viewed by anyone owning the next-generation DVD ROM player from Panasonic, and hopefully all the rest. Heck, let's go for the home run! Let's hope those DVD folks even manage to get those read/writable disks readable in DVD ROMs. This is greedy I know, but it is what we expect of CD-ROMs and why should we settle for less with DVDs?

Digital Display

This demo consisted of a "bake-off" between an analog flat panel display and a digital flat panel running the same software. The demo showed the performance benefits of digital interconnectivity versus traditional analog, the enhanced end-user experience of digital quality displays, and offered an early look at the scalability of a technology based on a comprehensive industry specification. Driven by the same machine, the digital display showed reduced noise and more saturated color over the analog display, and at a comparable price right out of the gate.

The concept is simple. A typical graphics card converts digital signals from the processor to analog which are then sent to the monitor. Analog flat panels convert these back to digital. So why go through the hassle: D to A, then A to D? Keep it digital all the way and eliminate a bunch of the complexity, cost, heat and power consumption from the system. Fortunately, this concept is easier to understand than the difference between the panels was to see. But if the technology delivers on its promise, who cares? I'll forgive the demo developer for sure. Fortunately, Intel was one of nine companies that founded the

Digital Flat Panel Working Group to define a standard so that all panels are compatible with all digital video outputs, which means this will be coming soon to a desktop near you!

Alert on LAN

Finally, something every business PC user wants—a technology that gives IT even more control over your PC This new technology enables PCs to send immediate alerts to network administrators when there are hardware or operating system failures, or when there is evidence of tampering. The unique value of Alert on LAN technology is its ability to generate these alerts, even if the system is powered off—even if the operating system is not loaded. In the demo, the case was popped off of a standard desktop creating a “case intrusion” alert on the management console.

So imagine this, you open up your chassis to add some RAM to your desktop and within minutes IT has you surrounded and the “cavity searches” begin. OK, so I exaggerate. I admit I did see the “Jerry Springer Show” once and have to admit that there are at least a few people from who even a computer needs protection. Alert on LAN technology *is* invaluable for keeping IT aware of problems booting, tampering and software failures. It still bothers me a bit that this can all be accomplished even in the absence of an OS and when the PC is off. I may be in therapy for months.

Summary

Well, there you have it. If we missed you this year we will see you next Comdex. Until then, us Technical Marketing types will keep spinning our “demo gold” from “technology straw” using all the magic we can muster. Our next opportunity to show our always compelling Intel® Technology demos is the Intel Developer’s Forum Conference in February. Hope we see you there! For more information, visit our [Web site](#).

About the author:

Tim Mostad says, “the majority of my 18 years at Intel have been spent in the pursuit of technical marketing nirvana.” He is responsible for demos, white papers, plugfests and technical training to support the adoption of new desktop technologies.

Top Stories

Design for Compliance: New PC 99 Test Metrics

By David Valdovinos
Marketing Program Manager
Intel Platform Compliance Operation

Compliance with the PC 99 System Design Guide baseline would be much easier with a clear set of pass/fail metrics. Intel and Microsoft are now gathering industry input to create consistent PC 99 System Test Specifications. Here's how you can get involved.

The PC 99 System Design Guide aids the evolution of the PC platform by encouraging industry-wide adoption of new technology initiatives and helping to provide baseline compatibility between PC platforms and applications. From an industry perspective, there is reason to believe that compliance to the System Design Guide baseline would be easier to achieve with a defined set of objective pass/fail criteria. To meet this need, Intel and Microsoft* are extending their PC 99 System Design Guide co-development effort and gathering industry input to create a new set of PC 99 Test Specifications and tests.

The System Test Implementers Forum (IF) is a new group of industry system builders and PC platform developers working to review, and lead the industry-wide implementation of, Test Specifications, including compliance tests related to design guidelines defined in the PC 99 System Design Guide. The System Test-IF is sponsored by Intel Corporation and Microsoft Corporation, and is open to all developers who want to participate by providing their inputs during development of the PC Test Specification and related compliance tests.

A related event, the PC 99 Hardware Test Specification review, will be held January 21, 1999 in Salt Lake City, Utah. Information about this event, membership in System Test-IF, and related draft specifications can be found at the [System Test-IF web site](#).

A Closer Look at the Test Specifications and Compliance Tests

The Test Specifications are designed to make it easier for developers to meet the compliance baseline by providing an objective set of pass/fail criteria. By defining test criteria for feature requirements, as well as for the industry standards and specifications referenced in the System Design Guide, the Test Specifications form a technical interpretation of the System Design Guide. The Test Specifications will be developed and administered with inputs and contributions received from the industry. A desired goal of the Test Specifications is for them to become the key metric for determining compliance with the hardware and software elements of the System Design Guide.

The Draft 0.1 release of the PC 99 Hardware Test Specification was released at the September, 1998 Intel Developer Forum and draft 0.3 is now available from the [System Test-IF Web site](#). This Test Specification focuses on new technologies in four areas of PC 99—ACPI (Advanced Configuration and Power Interface), PCI bus, digital & broadcast video, and 3D graphics. Long-term, the goal is for the Test Specifications to provide test coverage for the entire System Design Guide.

The current PC 99 Hardware Test Specification plan targets a release of draft 0.5 in December of 1998, followed by interim drafts with the goal of releasing version 1.0 in the first quarter of 1999.

Intel and Microsoft also plan to provide hardware compliance tests in the four technology areas contained in the PC 99 Hardware Test Specification and will make Beta tests available to developers by March of 1999. These Beta tests can be used by developers as an early evaluation tool that provides a preliminary indication of PC 99 hardware compliance. Microsoft will incorporate the final versions of the hardware compliance tests into their formal PC 99 compliance test releases and WHQL test kits. Interested individuals and developers are encouraged to visit the [System Test-IF Web site](#) and download the latest draft release of the PC 99 Hardware Test Specification for review.

Benefits of Membership in the System Test Implementers Forum

The new System Test-IF is co-sponsored by Intel and Microsoft and was created to encourage developer interest and participation in the implementation of the Test Specifications. For a \$2,500 annual company fee, the System Test-IF provides PC platform developers with several key membership benefits, including:

- Access to pre-Beta releases of the hardware compliance tests.
- Ability to submit on-line problem reports to help resolve test issues.
- Five printed copies of the release 1.0 Test Specifications.
- IF membership contact list.
- Invitations to IF-sponsored industry events, such as Test Specification reviews and compliance test workshops.
- Members-only access to the [IF Web site](#).

The members-only areas of the IF Web site provides access to technical discussion areas for submitting, searching for, and reviewing of comments, as well as for viewing IF-posted resolutions.

The System Test-IF also welcomes non-members to download and review draft Test Specifications, to view postings and resolutions in the discussion areas of the IF Web site, and to submit comments via email. Note that non-members need to sign and return a non-member developer agreement before their comments can be accepted by the IF. Participation in Test Specification review events is open to both IF members and non-members, though non-members may be charged a nominal fee to help offset the costs of the event.

The first PC 99 Hardware Test Specification industry review is scheduled for January 21, 1999 in Salt Lake City, Utah.

Plan to Attend the H/W Test Specification Industry Review on January 21, 1999

You can pre-register now from the [IF Web site](#) to join us at the inaugural PC 99 Hardware Test Specification review. This review will feature interactive, technical walkthroughs of the individual PC 99 Hardware Test Specification chapters (ACPI, PCI, 3D graphics, and digital & broadcast video) with emphasis on discussion of industry feedback and key issues. The objective of this event is to encourage industry interaction and consensus around the draft 0.5 release of the PC 99 Hardware Test Specification. The intended participants for the review are engineers who build personal computers, expansion cards, and peripheral devices based on the design guidelines presented in PC 99 System Design Guide.

We Want to Hear Your Voice

Intel and Microsoft are committed to working with the PC industry to deliver a consistent set of PC XX System Design Guides, Test Specifications, and compliance tests. The Test Specification provides objective System Design Guide test criteria that enables developers to design compliance into their products in a more predictable fashion with less effort.

Although our initial focus is to provide Hardware Test Specifications and hardware tests for four PC 99 technology areas, the industry now has a key opportunity to engage at ground zero and influence the Test Specification effort. Our plans call for release 1.0 of the PC 99 Hardware Test Specification and Beta hardware compliance tests in late Q1'99, or about one quarter prior to PC 99 compliance. Most importantly, our success depends on being able to hear your voice—now, how about giving *us* a test?

About the Author:

David Valdovinos is a Marketing Program Manager for Intel's Platform Compliance Operation. In addition to co-developing the PC XX Test Specifications with Microsoft, his responsibilities include gathering PC platform developer feedback and promoting industry-wide implementation of the Test Specifications.

For More Information:

Further details on System Test-IF membership, Test Specifications, FAQs, and the January 21, 1999 PC 99 H/W Test Spec review are available from the [System Test-IF Web site](#).

AMR-based audio/modem scalability

By Gary Solomon
Senior Platform Architect
Desktop Architecture Lab, Intel Corporation

Audio Codec '97 and the Audio/Modem Riser (AMR) specification create new opportunities for OEMs to reduce costs in Basic PCs, while supporting hardware scalability, flexibility and the build-to-order model.

The emergence of the extremely price-competitive Basic PC market segment makes finding ways to reduce platform costs a key objective for OEMs. While cost-reduction strategies are critical, many OEMs also need to ensure that their products are hardware-scalable. OEMs must also be able to choose flexibly between solutions offered by multiple hardware subsystem vendors while maintaining the highly successful Build-to-Order (BTO) system integration model.

The release of Audio Codec '97 Revision 2.1 (AC '97) and the Audio/Modem Riser (AMR) specification have created important new opportunities for OEMs to reduce platform costs in Basic PCs. At the same time, AMR-based audio/modem solutions address other key issues such as audio quality and ease of motherboard-based modem homologation/certification, while offering hardware scalability, flexibility and support for BTO.

AMR Benefits OEMs and Users

Developed in cooperation with the PC industry, Intel's recently announced AMR specification makes it easier to integrate audio/modem functions on a Basic PC motherboard by partitioning analog I/O functions onto an AMR riser module.

In the case of mobile systems, the analog functions are implemented on a Mobile Daughter Card (see the article "[Soft Technology for Low-Cost Mobile Solutions](#)" in this edition of *Platform Solutions*).

Motherboards supporting AC '97 with an AMR interface offer some important advantages for OEMs, not the least of which is a way to reduce the baseline implementation cost for audio and modem subsystems. Placing the analog modem circuitry on a riser module allows motherboard development to be independent of the often complex and time-consuming telecom certification process. Appropriate riser modules can be installed on motherboards immediately before shipment.

From the PC user perspective, audio quality has become an important item on the checklist of most new PC buyers. AMR helps here, too. Intel has seen significant improvements in audio quality (i.e., signal-to-noise ratio) by isolating the audio's analog electronics on the riser. (For a closer look at AC '97 R2.1 and AMR, see [Audio Technologies](#) in this edition of *Platform Solutions*.)

Supporting Scalability, Flexibility and BTO

Motherboards that support AC '97 and AMR enable a hardware-scalable range of solutions extending well beyond the lowest cost baseline configurations. Hardware scalability can be achieved by integrating hardware accelerated controllers onto the motherboard—or by providing fully standalone hardware accelerated solutions that plug into an expansion slot.

Beginning with the Baseline

In a baseline audio modem configuration, the AC '97 controller and AMR connector are soldered directly on the motherboard. The baseline AMR module consists of separate audio (AC) and modem (MC) codecs with a modem Data Access Arrangement (DAA), or for potentially lower cost, a combined audio-plus-modem (AMC) codec with a modem DAA.

Motherboard-Integrated Hardware Scalability

Building from the baseline configuration, OEMs can add limited integrated hardware scalability to a motherboard by designing for an additional accelerated AC '97 controller on the motherboard as well. When the time came to integrate the system, an OEM would then choose between two different versions of the motherboard. He would choose either the motherboard version with the baseline AC '97 controller, or the motherboard version with the hardware accelerated AC '97 controller. In the case of a non-

baseline configuration the baseline AC '97 controller can be either physically removed or disabled. An advantage of this approach is that it allows the reuse of the baseline platform's analog I/O circuitry, while optimizing costs for specialized products.

A platform Hybrid Approach: One Motherboard Layout—with Many Scalable Options

An alternative hybrid method provides a number of hardware scalability options that offer OEMs the advantages of a more flexible choice between audio and modem subsystem vendors, while also supporting the BTO model. AMR's modular partitioning enables designers to implement a cost-effective range of scalable solutions for Basic PCs, Performance PCs and everything in-between—all based on a single motherboard layout.

- For example, a system can be configured with baseline soft audio and a hardware-accelerated modem PCI add-in card. In this case the AMR module supports an AC '97 audio codec only, with virtually no baseline modem cost overhead.
- A system can reverse this arrangement, to feature baseline modem and a hardware-accelerated multi-channel audio PCI add-in card. The AMR module for this option would contain only modem-related analog circuitry and would not carry any baseline audio cost overhead.
- Finally, OEMs can configure a "sell-up" configuration with both multi-channel audio and a multiple-line modem, for example, implemented through hardware-accelerated PCI add-in cards. There is some relatively small cost overhead, because the baseline controller is not used. And, of course in this case, there is no AMR module present.

Advantages for OEMs

As the multimedia performance of Intel® processors increases, more audio and modem functionality can be accomplished in software. OEMs who choose to reduce the cost of platform ingredients by taking advantage of software-based audio and modem technologies can meet their objectives with motherboards that support AMR. They can also use the same AMR-based audio modem motherboard layout to scale performance through hardware, where and when they want it.

OEMs supporting BTO can integrate the audio and modem subsystems, choosing from a variety of vendors' products immediately before shipment while using a single, cost-effective motherboard layout.

About the Author:

Gary Solomon is a senior platform architect at Intel's Desktop Architecture Lab. He was a principal architect and co-author of the Audio Codec '97 and Audio/Modem Riser specifications.

For More Information:

The [Audio Codec '97 Web page](#) contains the AMR Specification revision 1.01, in addition to the AC '97 Component Specification revision 2.1.

Download [Intel's Audio / Modem Hardware Scalability white paper](#).

Also look for other [AC '97 and AMR white papers and related support information](#).

Soft technology for low-cost mobile PCs

By Terran Reneau
Platform Marketing Program Manager
Mobile and Handheld Products Group, Intel Corporation

The Mobile Daughter Card (MDC) specification enables OEMs to add low-cost scalable modem and audio functions to Basic and Mini-Notebook PCs. MDC also sets the stage for Intel's new mobile processors and chipsets slated for introduction in 1999.

Basic and Mini-Notebook PCs present OEMs with some interesting design challenges. While users expect ever-greater performance, Basic mobile platforms are generally far more costly to build than their desktop counterparts. Developers need new ways to reduce platform costs, without compromising value, features and performance.

Fortunately, continuing advances in mobile PC processor performance make it possible to migrate audio and modem functions from dedicated chipsets to software-based (a.k.a.: host-based) solutions. Working with OEMs and independent hardware vendors, Intel has coordinated the development of an Audio/Modem Mobile Daughter Card specification (MDC) that defines a common interface connector and mechanical form factor.

OEMs can use the MDC specification to add scalable modem and audio functions to their Basic and Mini-Notebook designs with a high degree of flexibility. The benefits for OEMs are reduced cost, board real estate savings and shorter time-to-market, combined with hardware-scalability that can deliver added performance from Intel's new mobile processors and highly integrated chipsets planned for introduction in mid-1999.

What's In It for OEMs?

The MDC specification, like Intel's Audio/Modem Riser (AMR) specification for desktop PCs, partitions analog electronics onto a module that is separate from the motherboard. The MDC features an AC'97 link, based on the latest revision of Audio Codec '97 specification, that supports audio codec, modem codec or combined audio/modem codec devices.

Designing with the MDC form-factor technology offers some clear-cut benefits for OEMs:

- Placing the analog modem electronics on the daughter card allows country-specific telecom certification issues to be resolved without impacting motherboard design.
- Power savings of as much as 2 watts can result by replacing PCI-based devices with audio/modem devices that are used only when needed.
- Modular daughter cards allows OEMs the flexibility to add selected audio and modem features in order to meet the needs of multiple market segments, and to support the Build-to-Order (BTO) business model.
- With MDC, audio/modem DSP chipsets will no longer be required. Intel® mobile processors will support these functions in simplified designs that integrate Intel's future AC'97 chipsets. This software-based audio/modem technology reduces platform cost and the component count from the bill-of-materials.
- The AC'97 link allows mobile designers to interface the soft modem, and/or audio codec directly to the CPU. This enhances reliability for users by moving audio/modem processing up in priority, while eliminating the need for DSP processing across a PCI bridge chip. The AC'97 link addresses latency issues that could otherwise affect audio or modem performance, allowing audio and modem functions to operate concurrently, while remaining invisible to end users.

- The MDC and AMR specifications represent the first technology of its kind to transcend both mobile and desktop platforms, providing OEMs with inherent cost savings.

Preparing for 1999

New high-performance Intel mobile processors and chipsets will emerge in the first quarter of 1999 designed for Basic and Mini-Notebook PCs. A new chipset with integrated AC'97 link technology is expected in mid-1999. OEMs who design with these new processors and chipsets will be able to capture the cost-savings and time-to-market advantages of the MDC specification, while preserving the flexibility needed to support the BTO business model. On the right is an example of the MDC design implementation.

Intel continues to aggressively address the issue of cost reduction in volume Mini-Notebook and Basic PCs, while at the same time helping to deliver performance that meets user expectations.

OEMs should prepare for what's coming in 1999 by contacting their Intel representative now for information about Intel's mobile processor and chipset roadmap. IHVs should be prepared to provide OEMs with audio/modem solutions that meet the MDC specification.

About the Author:

Terran Reneau is responsible for developing and executing Intel's marketing programs for Basic full-size and Mini-Notebook PCs, including platform technologies surrounding the microprocessor that create demand for existing and emerging mobile systems.

For More Information:

The latest revision of the [Mobile Audio/Modem Daughter Card Specification](#) can be downloaded from Intel's Web site.

Downloadable versions of the AMR Specification version 1.01 and the AC'97 Component Specification revision 2.01 is available on [Intel's Audio Codec '97 Web page](#)

Check out the article on [Mini-Notebooks](#) by Terran Reneau and Dave Kaufman in the *Platform Solutions* archive, Issue #9.

[Intel's press announcement of the AMR/MDC specifications](#) is available from the Intel on-line Press Room.

Alert on LAN*: New Frontiers for PC Manageability

By Matthew Jung
Product Marketing Engineer
Intel Corporation, Network Products Division

See how Alert on LAN complements the Wired for Management specification to deliver new levels of PC manageability for IT managers—an important new opportunity for OEMs to further differentiate their manageability solutions.*

Alert on LAN* provides new levels of PC manageability for corporate IT departments, while offering OEMs and developers another way to differentiate their advanced manageability solutions.

Maintaining and managing PCs has historically proven to be a costly, time-consuming and difficult process. The Wired for Management (WfM) specification, however, takes important steps forward in providing solutions to the ongoing problem of PC maintenance. But while WfM has gone a long way to advance the frontiers of PC management across today's business enterprises, new technologies continue to be developed that work in conjunction with WfM to take the next steps. One of the latest of these technologies is Alert on LAN*.

On The Alert

Co-developed by IBM and Intel, Alert on LAN ventures beyond the WfM baseline to provide OEMs and platform developers with new opportunities to add value and differentiate their manageability solutions. It builds on WfM to provide three principal benefits:

- **Environmental Alerts**
Alert on LAN acts as a “burglar alarm” for PCs, enabling them to send alerts during the detection of chassis intrusion or removal of the microprocessor. Alert on LAN can also act as a “guardian angel” for PCs by sending out alerts to IT staffs which correspond to such deviations as voltage irregularities and high chassis temperatures. In providing these capabilities, Alert on LAN breaks new ground by sending out alerts even while a PC on the network is powered down¹. Previous to Alert on LAN, environmental alerts could only be sent out when a PC was operating in its powered-up mode.
- **Built-In Silicon Timer**
Alert on LAN utilizes a timer built into the silicon that is refreshed by an agent that Intel provides for use with Windows** operating systems. If the timer is not refreshed—as in cases where the operating system is “hung”—Alert on LAN automatically sends an alert out to the IT staff. This capability enables IT professionals to quickly identify problems across the network, particularly in cases where new hardware or software applications have been recently deployed in large-scale enterprise environments.
- **Presence Monitor**
Alert on LAN sends out “presence heartbeats” that let IT managers know that a PC is alive and well on the network, even if that particular computer is powered down. By providing this capability, Alert on LAN does more than just act as a sentinel to report problems; it also monitors the entire network to provide status on fully functioning and problem-free PCs.

Overall, Alert on LAN provides manageability that is independent of a PC's operating system (O/S) or power state. This includes the pre-O/S state, which is defined as a “naked” client with no O/S loaded, or a client that is connected to the network but is asleep. Alert on LAN is applicable across a number of client states—such as during new system O/S installation activities (e.g., Preboot eXecution Environment), or when there is O/S failure during normal user interaction or during off-hours maintenance.

¹ “Powered down” defined as AC power applied to system but operating system not present. Includes ACPI sleep states and non-ACPI suspend.

Alert on LAN for the Motherboard

Today, platform and I/O peripheral manufacturers can easily implement Alert on LAN capabilities on the PC motherboard. The current wave of LAN on Motherboard (LOM) or “LAN down” solutions is supported by the Intel® 82558 controller—which, in conjunction with the Alert on LAN ASIC, builds on the baseline established by the latest WfM specification.

To fully implement Alert on LAN on the system motherboard, developers need two additional chips—an Alert on LAN ASIC available from LSI Logic, and a hardware-monitoring ASIC such as the DS1780 or the ADM9240. By providing this functionality on the system motherboard, OEMs can implement advanced manageability features at considerably less expense than that entailed by alternative approaches such as adding in a separate system management card.

For OEMs that lack the resources to design their own component-level solutions, Intel provides motherboards that incorporate Alert on LAN technology. Whether it's designed from the ground up or implemented as a pre-configured motherboard solution, however, Alert on LAN breaks new ground in the PC manageability arena. Simply put, it provides a constant vigil around the clock that allows IT managers—and the PCs for which they're responsible—to sleep more securely.

About the Author:

Matthew Jung is a product marketing engineer in Intel's Network Products Division, where his responsibilities include working to define advanced LAN manageability solutions.

**Wake on LAN and Alert on LAN are results of the Intel/IBM Advanced Manageability Alliance and are trademarks of IBM.

For More Information:

For more information on Alert on LAN and associated technologies, please check out the following Web sites:

- [Intel® networking technologies Alert on LAN](#)
- [IBM/Intel® Advanced Manageability Alliance](#)

SM BIOS: A Key Building Block for WfM 2.0 Platforms

Bruce Billo
Wired for Management Platform Marketing Manager
Intel Corporation

The SM (Systems Management) BIOS specification is one of the most important foundations for PC management solutions in enterprise network environments. SM BIOS Version 2.3 enhances the spec and fully supports WfM 2.0.

Version 2.3 of the SM BIOS specification enhances previous versions of the spec and fully supports WfM v2.0—the latest release of the Wired for Management Baseline specification.

The SM BIOS specification has been evolving since 1996, when Intel—in conjunction with OEMs Dell Computer, Compaq, Hewlett-Packard, and IBM, along with BIOS vendors AML, Phoenix Technologies, SystemSoft and Award—developed the first version of the spec. Known in those days as DM (Desktop Management) BIOS, the specification soon became known as SM—for Systems Management—BIOS. Today, the SM BIOS spec is one of the important foundations underlying the creation of solutions for managing PCs in networked enterprise environments.

A Dependable Source of Platform Data

In order to be manageable, a system's platform data must be accessible. Without a uniform access method, management applications would have to rely on proprietary methods for obtaining detailed platform information—such as processor type, memory and slot configuration, etc.—known only to the platform's BIOS. Because such proprietary methods vary among management applications and platforms, they can become a costly implementation burden for vendors, as well as a source of frustration to customers, who must face a tangle of applications and platforms that do not work together.

Version 2.3 of the SM BIOS specification provides a single, well-defined access method (the table-based method) and a minimum required set of data available, helping to enable interoperability between platforms and management applications. As a necessary building block, SM BIOS has been included as a requirement in industry specifications such as Wired for Management (WfM) Baseline v2.0, as well as the Intel/Microsoft PC99 System Design Guide.

Advanced System Management Support

To keep current with the latest technological advances, OEMs, BIOS vendors and system management application developers should support SM BIOS v2.3 in their next-generation products. The combination of conforming platforms with management applications, such as Intel LANDesk® Client Manager as well as other management applications, will provide customers with a rich system management functionality.

In addition to providing a uniform collection of platform data, version 2.3 of the SM BIOS specification adds support for several important new Wired for Management Baseline capabilities, including:

- **Boot Integrity Services**
WfM v2.0's new Boot Integrity Services enable downloaded boot images to be authenticated using digital signature technology. As a result, IT managers can ensure that systems booting from the network use only boot images that are IT-approved.
- **System Boot Status**
It's useful for a management application to know not only when, but also why a specific system boots up—whether it's being turned on during normal operation, or rebooting after a crash, for example. SM BIOS v2.3 provides the application with codes from its table that communicate this information.
- **UUID/GUID Support**
SM BIOS v2.3 also requires that systems include a platform Globally Unique Identifier (GUID)—also known as a Universally Unique Identifier (UUID). The UUID/GUID serves as a unique identifier for each and every platform on the network; SM BIOS v2.3, in turn, provides a means to expose this valuable information to whatever management applications are being employed.

As with Wired for Management, Intel remains committed to enhancing and advancing the SM BIOS specification in the future to enable the development of new and improved computing platform solutions across the industry. Moving forward, Intel plans to work with its OEM and BIOS co-authors to integrate into subsequent versions of the SM BIOS spec the capability to access dynamic system data and events using an ACPI-compatible interface.

Part of a Total Management Solution

The addition of SM BIOS is simply one among many enhancements that can be found in WfM v2.0. Others include augmenting existing support for the Desktop Management Interface (DMI) with support for the newer Common Information Model (CIM); an improved architecture for the Pre-Boot eXecution Environment (PXE); new remote wake-up capabilities; notification of Platform Events via SNMP traps; and support for remote management applications that need to lock a system's keyboard and mouse during sensitive operations. Look for more details on these and other WfM Baseline v2.0 features in upcoming editions of *Platform Solutions*.

About the Author:

Bruce Billo is a product marketing manager chartered with overseeing Intel's platform marketing and enabling efforts related to the Wired for Management initiative.

For More Information:

For more information on SM BIOS and associated technologies, please visit the following Web sites:

- [SM BIOS v2.3 specification](#)
- [Wired for Management Baseline Specification requirements](#)
- [Design guide targeted at OEMs implementing SM BIOS](#)
- [Information from Microsoft on their SM BIOS WBEM/WMI Provider.](#)

The following links provide other recent WfM Baseline v2.0 stories in *Platform Solutions News*:

- [Remote Wakup comes to Mobile Computing](#)
- [WfM Baseline Specification v2.0 Extends PC Management Capabilities](#)
- [Extending Pre-Boot Execution \(PXE\) to Mobile Platforms](#)

Intel® Web Design Effects—it's easier to send a recipe than a cake

By Jerry Weber
Senior Product Marketing Manager
Intel Architecture Labs

Intel® Web Design Effects is a playback and authoring tool from Intel Architecture Labs that harnesses the power of Scalable Media technology. Discover how it brings Web pages to life, while helping PC users get the most from their system resources.

The inescapable irony of the Internet is that many users employ 450 MHz Pentium® II processor-based PCs with AGP technology and sophisticated graphics accelerators to access Web pages that consist primarily of static text and images. This is especially ironic when you consider that Scalable Media authoring technologies now exist that can make the Web a more satisfying experience for users—and a much more valuable medium for content developers and their clients.

When your arch-competitor's Internet site is just a click away, it only follows that your Web pages should be as rewarding and visually compelling as possible. Unfortunately, the limitations of small pipes and legacy PC systems can often cause developers to aim their multimedia content at the lowest common denominator of system and modem capabilities. The result is quite often a Web presence without the advantages that animation, 3D audio and video can deliver. Alternatively, developers may be forced to author multiple versions of content on a given site in order to span the disparity of client systems.

As part of its Internet Media Initiative, Intel Architecture Labs (IAL) has developed Scalable Media technologies that can deliver the full potential of the Internet and allow PC users to get the most from their available system resources. One of the most important of these scalable technologies is the Intel® Web Design Effects (WDE) playback and authoring tool.

Media Scalability

By adapting to the processing capabilities and bandwidth capacity of the client platform, scalable content enables the receiving computer to play a multimedia component at the highest degree of realism that the processor can support. Content developers can "author once" with the assurance their content will play on Intel Architecture, regardless of the bandwidth limitation. The later the processor version, the better the media experience will be

There are three techniques for scalability—progressive, layered and procedural. Each has its advantages in specific applications:

- Progressive JPEG image rendering is an example of progressive scalability. Image components are ranked, most to least. Instant rendering is possible, and the technique permits the user to exit early. Another example is progressive 3D, using IAL's 3D multi-resolution mesh. The 3D image renders instantly with minimum number of vertices, and the number of vertices scale with time. The longer the connection, the more detail is possible.
- Layered techniques are composed of base and subsequent enhancement layers. An example is a base layer of video, over which enhanced video and audio layers are added. This technique, like progressive, provides increased flexibility and also gives users the option of early exit.

Intel® Web Design Effects: Procedural Scalability

The third way to create scalable content is through the procedural technique. Intel® Web Design Effects comprises two tools and playback features for two Web environments. The first is through HTML and 4.0 browsers, the second is using Macromedia* Director 7 and Shockwave*.

The procedural method works by sending instructions to the client, where an algorithm relies on the power of the processor to render the image. Procedural scalability is similar to sending the recipe for making a cake, instead of shipping the entire cake. For multimedia authoring and Web content creation, it is an approach that can make downloads a lot less tricky.

The algorithm used in Web Design Effects produces pixel animation as the RGB values are changed, based on a source color palette. The resulting effect produced by the “natural” algorithm is suitable for creating interesting atmospheric effects that can add a pseudo-realism to your content. The second feature of the WDE algorithm is the ability to squash, mutate or stretch a source bitmap; which is what is called “distort.” The distort feature is available in our Macromedia authoring tool.

- Intel’s WDE 1.5 authoring tool is integrated into Macromedia Director* 7, providing easy-to-use Shockwave* effects for the Internet that add dynamic new animated content, without significantly adding to download time. For users, WDE 1.5 for Macromedia Director produces compelling atmospheric and distortion effects that can bring otherwise static Web content to life, without inducing download delays. As an example of the capability of the WDE authoring tool, a simple interactive Shockwave game was enhanced. The game involving shooting floating balloons, which had a code requirement of 93 Kbytes. Adding alpha-blended clouds and animated flames for the explosions was accomplished with just 7 Kbytes of additional code. The new version was visually more compelling without adding much to the file size.
- The Intel® WDE 1.2 Web authoring tool is an easy to use animation tool that works as a standalone application or as a plug-in for the HotDog Professional 5* Webmaster Suite from Sausage* Software. WDE 1.2 creates visually compelling atmospheric effects that scale to the power of the processor. The playback for the HTML version of WDE ships with Microsoft Internet Explorer* 4.0 and is available as a plug-in for Netscape Navigator* 4.0. The tool is available for purchase and download from [Sausage Software’s Web site](#).

Making Web 3D a Reality with Existing Pipes

Intel Architecture Labs continues to advance the Internet Media Initiative by creating technology that the industry can use to obtain the most benefit from the latest generation of powerful PCs, while optimizing existing bandwidth resources. For example, one current objective at IAL is to design a scalable video codec, with emphasis on interactivity within the video stream. Another project is aimed at making 3D possible over the Internet, using existing pipes.

Visually rich content can be bandwidth-friendly. By using Web Design Effects you can set your Web pages apart from the billion other pages, while supporting market visibility and market leadership through your Web presence. Intel Architecture Labs Internet Media technologies enable developers to deliver the most compelling end user experience for Intel Architecture platforms.

About the Author:

Jerry Weber is responsible for Intel Web Design Effects product management and marketing. He describes himself as the “3D effects and authoring Czar” at Intel Architecture Labs.

For More Information:

Learn more about [Intel® Web Design Effects](#) by visiting the Web site.

For details on [Macromedia Director 7](#), visit the Macromedia Web site.

For information on the [HotDog Professional 5* Webmaster Suite](#) from Sausage* Software, visit the Sausage Software Web site.

Gamers chat it up with Intel Multi-Point Audio

By David McFeeters-Krone
Senior Product Marketing Engineer
Intel Architecture Labs, Intel Corporation

Multiplayer Internet games are tons of fun. But stopping to type-in messages to other players can slow the action. Intel's Multi-Point Audio software now offers software developers an easy way to add Internet Protocol (IP) voice communications capability to their applications.

Multiplayer Internet games are fun. But stopping the action to type messages to other players can spoil the mood. Intel's Multi-Point Audio software now offers software developers an easy way to add Internet Protocol (IP) voice communications capability to their applications. It all adds up to a more realistic and interesting experience for gamers, who can converse, taunt and vocally interact concurrently while the game action proceeds uninterrupted.

Intel's Multi-Point Audio Integration Kit is a Software Developers Kit (SDK) that developers have already used to add voice capability to multiplayer games for up to four participants. It's software that definitely has people talking.

What is Multi-Point Audio?

Intel® Multi-Point Audio software allows multipoint IP telephony conferencing. The untapped processing power of a Pentium® II processor-based PC can be used to host the conference, meaning one of the participants hosts the conference, thereby eliminating the need for a third-party server. With Multi-Point Audio, users can play an Internet-based game, for example, while also simultaneously talking to each other.

In addition to multiplayer Internet games, the software can also be used in joint Web browsing and Internet shopping applications, or in any interactive environment where vocal interaction can enrich the experience. Intel Architecture Labs is also exploring the use of Multi-Point Audio in business conferencing applications.

Applications and Products

Multi-Point Audio is incorporated in ThrustMaster® Talk n' Play® software—a stand-alone product that allows up to four gamers to talk over the Internet while simultaneously playing online. Talk n' Play sends the sound from each user's microphone via standard Internet protocol to the host machine and returns a multipoint audio mix to each participant.

ThrustMaster has announced that Talk n' Play software will be bundled with its products in addition to selected entertainment software titles. A release of ThrustMaster Talk n' Play software is available for download from the ThrustMaster Web site.

Intel has also demonstrated Multi-Point Audio with a wide range of popular software titles and is currently in discussion with independent software developers for license of the Multi-Point Audio SDK.

Intel's Multi-Point Audio Integration Kit

The Intel Multi-Point Audio Integration Kit is now available for license. The kit contains a Web Participant Line Control (WpIX) API that interacts with a set of ActiveX® controls and supporting DLLs. It also includes sample source code and documentation. Developers can use the kit to incorporate H.323 multipoint audio conferencing technology into a wide variety of applications:

- The Multi-Point Audio WpIX control can be integrated into a multiplayer game, enabling participants to talk to each other while playing. One team of players could conduct a private conference to plot against another team.
- Developers can integrate the Multi-Point Audio WpIX control into voice conferencing programs and "buddy list" applications that allow multiple users to talk to each other over the Internet.

- Multi-Point Audio WplX controls can be embedded into a Web page, allowing users to host their own audio chat.

System Requirements

Systems hosting an Intel Multi-Point Audio conference should include at least a 200-MHz Pentium[®] processor with MMX[™] technology, a minimum 32 Mbytes of RAM, Windows[®] 95 or Windows 98 and 56.6-Kbps Internet access.

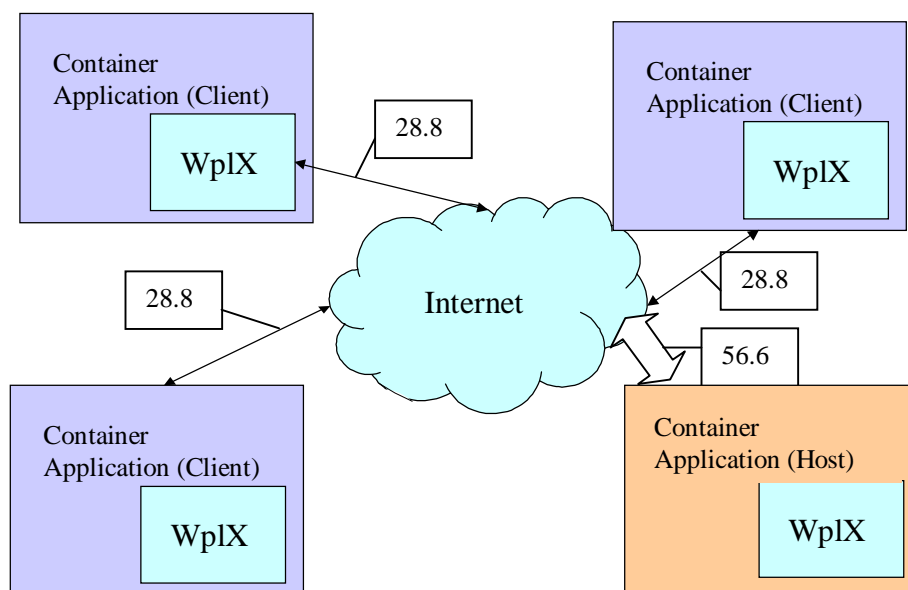
Minimum system requirements for Multi-Point Audio conference clients include a 90-MHz Pentium processor or higher, Windows 95 or Windows 98 operating systems, a minimum 16 Mbytes of RAM, a 28.8 Kbps or faster modem and Internet access.

Both host and client systems require a sound card with speakers (or headset) and a microphone for voice input. Intel Multi-Point Audio software is compatible with DirectSound[®] compatible soundcards and will also work in wave mode.

Let's Talk

Through its Conferencing and IP Telephony initiative, Intel is helping the industry create more compelling end-user experiences through IP Telephony. Intel's Multi-Point Audio Integration Kit lets software developers quickly enrich their products using the power of multipoint IP telephony.

Intel is now licensing Multi-Point Audio on a per-customer basis. If this sounds interesting to you, we definitely need to talk.



Intel[®] Multi-Point Audio software

Intel[®] Multi-Point Audio software provides the capability to manage and participate in H.323 multipoint audio conferencing over the Internet using the Web Participant Line Control (WplX). The WplX Control interacts with a set of ActiveX controls and DLLs that allow the integration of H.323-compliant multipoint audio conferencing into existing applications such as games, buddy lists, and HTML scripts within Web pages. Once these ActiveX agents are embedded in the application or Web page, audio conferencing becomes possible through the program's graphical user interface.

About the Author:

David McFeeters-Krone is a Senior Product Marketing Engineer in the Conferencing and IP Telephony Initiative of the Intel Architecture Labs. He is responsible for defining and evangelizing the enhanced capabilities of presence and IP telephony, and the licensing of Intel's related technologies.

For More Information:

For more information about the Intel Multi-Point Audio Integration Kit or licensing, contact David McFeeters-Krone at (503) 712-1366.

For information about the ThrustMaster Talk n' Play application with Intel Multi-Point Audio software, visit the [ThrustMaster](#) Web site.

Mini-notebook power management: What's different

By Michelle Chuaprasert
Platform Marketing Program Manager
Mobile and Handheld Products Group, Intel Corporation

Randall Scott
Platform Architecture Manager
Mobile and Handheld Products Group, Intel Corporation

Managing power is a huge issue for designers of Mini-Notebook computers. These diminutive PCs have their own unique requirements. Making the correct decisions now will avoid potentially costly changes down the road.

Editor's note: for a quick introduction to the emerging Mini-Notebook form factor, check the article on [Mini-Notebooks](#) by Terran Reneau and Dave Kaufman in the *Platform Solutions* archive, Issue #9.

Mini-Notebook computers can present very large power management headaches for developers who think these diminutive PCs are nothing but scaled-down versions of standard notebook systems. Merely applying conventional notebook PC power management techniques could seriously limit the potential of this important new class of PCs. Making the correct decisions at this early stage of development will avoid potentially costly revisions in the future.

Let's take a closer look at what's unique about Mini-Notebooks from a power management perspective.

Some Important Differences

Because of their smaller form factor and specialized usage model as convenient secondary computers, Mini-Notebook PCs differ from full-size notebooks in a number of important ways—and each of them can have an important bearing on power management:

- Smaller displays require high-quality design.
- 3D graphics acceleration is not as critical as the speed of 2D rendering, but it should still provide an adequate user experience.
- Because the Mini-Notebook is a secondary computer designed to communicate with the main PC and the Internet, connectivity is extremely important, including the provision of a modem and multiple PCMCIA slots.
- The battery is likely to be smaller, probably a 3x2 lithium-ion cell package, rather than the 3x3 or 3x4 cell batteries found in conventional notebook PCs'.
- Hot spots may be more noticeable because of the smaller package.

Power Issues

Mini-Notebook form factors, including the popular B5 form factor (8.2" x 10.2" x ~1"), limit the amount of power that can be dissipated through the case. The Mini-Notebook thermal envelope specified in the Intel® Mobile Power Guidelines 2000 is only 12–14 Watts. The A5 form factor is also popular, and actual mini-notebook dimensions vary based on the manufacturer.

Since power is driven by the square of the voltage, Mini-Notebook platform components must use the lowest voltage possible. Developers should focus on reducing voltage where it is highest. Currently the PCMCIA slots still have 12 volts. SDRAM is expected to be applied in Mini-Notebook designs for some time to come, and this is another area that would benefit from a reduction in core voltage.

Independent hardware vendors responsible for each of these components should emphasize voltage reductions to tune their products for Mini-Notebook systems. For their part, OEMs need to specify low-power devices optimized for Mini-Notebook applications.

Cleaning Up the Graphics Picture

Graphics requires aggressive power management. Developers should focus on several key areas, including reducing core voltage in graphics accelerators, integrating the frame buffer and improving host bus power management. PCI graphics solutions need to make use of the PCI CLKRUN# signal to facilitate dynamic starting and stopping of the clock as often as possible. AGP is not expected to be used in Mini-Notebooks. If it were, the AGP_BUSY# and STOP_AGP signals would be required to enable management of the clocks to the graphics controller. The default condition should be for all peripherals on the bus to be off. Future operating system policies should be modified to aggressively shut down peripherals when they are not in use. Especially valuable is the Advanced Configuration and Power Interface (ACPI), because it provides the mechanisms to allow the operating system to implement such a policy.

Now Hear This: Power-Efficient Modem and Audio

In its role as a secondary computer, a Mini-Notebook may not require stereo speakers. However, it should have a stereo output jack so users may use external speakers or headphones if desired. Soft audio/modem technologies can also help reduce chip count and power consumption by replacing "always on" DSP components with AC'97-compliant devices that are on only when they are being used. Even with increased CPU usage in soft audio/modem designs, power consumption can be reduced. For further information, see the article on [Soft audio/modem technology](#) in this month's issue of *Platform Solutions*.

In the Mini-Notebook Space, Power Management is Huge

The special role of Mini-Notebooks and their unique physical and battery limitations place stringent demands on power management. The use of conventional notebook PC power management techniques alone is not enough. OEMs and their suppliers need to expand their thinking into new areas of power management. Doing it right at this stage will avoid problems as the Mini-Notebook platform evolves.

About the Authors:

Michelle Chuaprasert is Platform Marketing Program Manager in Intel's Mobile & Handheld Products Group. She manages the development and implementation of mobile platform computing initiatives that enable system and component manufacturers to design and deliver compelling high-performance mobile PCs.

Randall Scott is Platform Architecture Manager in the Intel Mobile & Handheld Products Group. He is responsible for power management and power reduction programs.

For More Information:

Check out the article on [Mini-Notebooks](#) by Terran Reneau and Dave Kaufman in the *Platform Solutions* archive, Issue #9.

For information on the Intel® Mobile Power Initiative see the [Mobile PC Power Technology Forum](#) Web site.

Technical information and the latest Mobile Power Guidelines 2000 are available at the [Mobile Power Initiative](#) Web site.

The [ACPI specification](#) is available at the Mobile ACPI Web site.

Information about the [Smart Battery System](#) (SBS) is available at the SBS Web site.

Read about the [Intel® Power Analyst](#).

Check out the latest developments on [IPMAT](#).

Read the latest information on the [Intel® Power Monitor](#) (IPM).

Read the "Recommendations to Windows* 95 Application/Driver Developers for Writing [Power Friendly Software](#)" applications note.

Tools you can use for power-efficient mobile design

By Michelle Chuaprasert
Platform Marketing Program Manager
Mobile and Handheld Products Group, Intel Corporation

Power efficiency is a key element in the continuing evolution of mobile systems. Simple measurements of battery life are no longer enough. Intel offers the specialized tools developers need to implement new power-efficient designs.

As features and performance in mobile systems continue to increase, power efficiency has become an even more important issue for OEMs. We have reached the point where simple measurements of battery life are no longer adequate to allow ongoing platform improvements. The guidelines incorporated in the Intel® Mobile Power Initiative and reflected in the Intel® Mobile Power Guidelines '99 are now beginning to appear in systems designed for shipment in 1999. At the same time, the industry is migrating new systems from Advanced Power Management (APM) to the much more sophisticated Advanced Configuration and Power Interface (ACPI). As these new platform designs are completed, OEMs, software developers and component suppliers alike need sophisticated yet practical tools that they can use to measure the power efficiency of their products and to pinpoint areas for further improvement.

Three tools are now available from Intel that allow developers to measure power efficiency of mobile systems at the application software, system software and platform hardware levels. All three have an important role to play in every new mobile PC design.

Intel® Power Monitor (IPM)

Now available in version 3.1, Intel Power Monitor (IPM) helps developers measure the effects of application and operating system software on system power. Power-management software extends battery life by spinning down the hard drive, switching off the display, halting the processor, and turning off parts of your notebook computer when those parts are not performing work. By fixing software that impedes the power management features of a notebook computer, the application developer can reduce power consumption and thereby extend battery life. One of IPM's principal advantages is that it allows developers to test the power usage of individual applications without additional test equipment.

IPM identifies coding structures that may be inherently power inefficient. For example, it can pinpoint and insert alternatives to repetitive "PeekMessage" calls, which are essentially loops of code that can waste CPU resources while waiting for a signaling event. The developer immediately sees the impact of the coding change in IPM's graphical display of system power, estimated from measurements of CPU activity. Using the optional battery interface, IPM can report *actual* system power instead.

IPM has been successfully employed to make numerous applications power-friendly, including Microsoft® Office 2000, Visible Decisions, Inc.* VizIT in 3D, Globalink® Power Translator Pro 6.4, and many others. This easy-to-use tool should be used whenever software is revised.

IPM (v3.1) has been recently updated to support Windows® 98 and ACPI. To learn more see our [IPM site](#) and download a complimentary version of the tool. It requires a PC with an Intel® Pentium® processor, or faster.

Intel® Power Management and Analysis Tool (IPMAT)

System software and platform developers use IPMAT to tune their systems for optimum power management under ACPI. They can see the effects of individual component and system level ACPI power states on system power consumption. Based on this information, developers can make decisions that improve the power management of the system and thus extend battery life.

IPMAT works by measuring the changes in system power consumption and latency that occur when a system or its devices enter different ACPI power states. The developer has control over how this happens and may place devices directly into various ACPI states or set up IPMAT to handle multiple

devices and states automatically. If benchmarking is a requirement, IPMAT may be used to monitor system power in different usage scenarios. This feature may be especially useful to qualify and select component vendors.

IPMAT is available now, and details regarding licensing and hardware requirements are posted at the [Intel Performance Evaluation and Analysis Kit Web site](#).

Intel® Power Analyst (IPA)

This tool provides a direct look at the power characteristics of individual components, subsystems, and batteries. By measuring all selected components and subsystems concurrently, IPA can be employed while executing benchmarks, applications, and other usage scenarios to determine where power is being consumed in the system. It can also be used to determine whether the system is performing within the 25-watt thermal envelope in accordance with the Intel Mobile Power Guidelines. In addition, IPA allows developers to verify that device power consumption tracks with ACPI state changes.

Also available to simplify IPA power measurements, the MPDK2 kit includes a fully instrumented motherboard and connector and test resistor for each component to be measured. IPA converts measured voltage drops across these resistors into power information presented through a flexible graphical interface. For [more information](#) on software features and required hardware see the [Intel Power Analyst site](#).

Taking a Big Step

The transition from APM to ACPI power management has set the stage for significant improvements in power efficiency in mobile platforms. These improvements allow developers to add features and performance within thermal, size and battery constraints. For the greatest effect, a system-level approach is required, encompassing application software, system software, and platform hardware. Using IPM 3.1, IPMAT, and IPA improves the results in each of these areas. The Intel Mobile Power Initiative provides targets for the industry to shoot for—and Intel now offers the tools the industry can use to hit them.

About the Author:

Michelle Chuaprasert is Platform Marketing Program Manager in Intel's Mobile & Handheld Products Group. She manages the development and implementation of mobile platform computing initiatives that enable system and component manufacturers to design and deliver compelling high-performance mobile PCs.

For More Information:

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Platform News

Business Desktop

Intel® LANDesk® Management Suite Named PC Magazine Editors' Choice and PC Computing MVP Winner

PC Magazine has selected Intel® LANDesk® Management Suite as the [Editors' Choice](#) in its Dec. 1 review of desktop management software suites. The magazine recognized LANDesk Management Suite for offering "the best-integrated, most powerful, and easiest-to-use features, coupled with nimble scalability and peerless DMI support."*

Consumer Desktop

Multiple Home PCs Create Need for Home Networks

Like cars, telephones, and television sets before it, one home PC is not always enough to meet the needs of the average American family. [Home Networks](#) will help families share Internet access, printers, and information. According to a recent survey by Intel, more than 70 percent of multiple-PC households said they would find a home networking product appealing.

Server

Intel and Internet/Telecom Leaders to Publish Guidelines for New Server Category

[Intel has announced industry support](#) and cooperation in the development of a set of platform specifications for a new category of server "appliances." The goal of this industry effort is to produce a design guide that defines common hardware platform basics for the emerging network-based server appliance market segment. This segment covers a broad range of functions and performance levels. With growing momentum for this market segment with Telecom and Internet Server Providers (ISPs)—as well as with Internet-based businesses -- customers are sure to benefit from an industry commitment to a set of specifications that help assure reliability, stability and broad application support.

Intel Introduces Next Generation Input/Output for Servers Platforms

Intel has introduced the [Next Generation I/O \(NGIO\) specification](#) - a technology for moving information within high-performance next-generation computer servers. The NGIO specification was announced at an open industry forum in November that focused on next generation input/output directions. The goal is to have these technologies within server systems to keep pace with the growing demands of enterprise-class software solutions and the continuous increases in processor performance. The NGIO specification is the culmination of approximately two-years of cooperative work involving more than 20 leaders in the computing industry.

Workstation

WTX, version 1.0 Form Factor Specification is Available

The [WTX Specification](#) is a flexible and robust form factor for Intel® Architecture-based workstations. It supports the power, volume, and thermal dissipation requirements of the AGP Pro graphics specification.

Mobile

Mobile Audio/Modem Daughter Card (MDC) Specification 0.91 Available for Download

[MDC](#) defines a common standard interface connector and mechanical form factor for adding modem and/or audio to Basic and Mini-Notebook mobile form factors. By placing the sensitive analog components on a daughter card, higher audio quality and easier modem certification are enabled. The MDC will utilize an AC97 2.1 link, which includes support for Audio Codec (AC), Modem Codec (MC) and Audio/Modem Codec (AMC) devices. New Basic and Mini-Notebook designs are expected to utilize the AC97 feature in 1999 in combination with a future mobile chipset to minimize board real-estate and maximize component savings to further reduce overall BOM costs in these mobile form factors. OEMs are expected to benefit from greater audio and modem diversification of products along with the potential build to order (BTO) and configure to order (CTO) advantages the MDC specifications may allow.

Technology News

DVD

DVD & DirectShow* Developer Days Coming January 11-12

Sponsored by Intel and Microsoft*. Mark your calendar! This event is intended to promote the development of DirectShow titles for DVD. It will include an in-depth training session on DirectShow, how it works, and how to design DirectShow titles. Training will be followed by a DirectShow Development lab and a test suite. The DirectShow Development lab is the place for software developers to debug their DirectShow code, develop new code, or port from MCI to DirectShow. Experts from Intel and Microsoft will be on hand to assist with development. Visit the *Platform Solutions* [plugfest page](#) for more information.

Intel Presentation to the DVD Forum Conference in Barcelona

Intel's Lila Ibrahim, DVD Industry Marketing Manager, presented "The PC DVD Experience" in Barcelona on October 28. Her presentation focused on what the PC brings to DVD in the areas of Interactivity, Expandability, Connectivity, and Creativity. The presentation is available for download at the [DVD technology page](#) in PSN online.

Looking for Interactive DVD Content?

There is a list of interactive titles currently available at the [DVD technology page](#). ISVs—to add your titles to the list, please send an email to *Platform Solutions* (platform.solutions@intel.com) with your title, company, and URL. This list will be updated monthly.

Memory

Addition to PC SDRAM DIMM Specifications

Intel delivered the PC100 SDRAM Component Spec and Serial Presence Detect and 100-MHz DIMM Spec to major vendors and OEMs in 1998. They provide the information needed to develop memory modules to support the latest Intel® Architecture platforms into the beginning of 1999. The latest addition is a [specification for "Low Cost 8Mx8 based Unbuffered PC SDRAM DIMM."](#) that allows for single sided assembly for 64-MB modules.

Direct RDRAM on Track for 1999 Ramp

PC OEMs are encouraged to design systems that can support multiple speed versions of RDRAM, in particular 300 MHz and 400 MHz. This will allow for the most cost and availability flexibility. PC OEMs and DRAM vendors should continue the process to further discuss the anticipated product ramp in 1999. Visit the [memory technology page](#) on PSN.

Networking & Communications

Leading OEM Manufacturers and Intel Deliver Gigabit Solutions

In November, [Intel announced](#) that Compaq*, Dell*, Fujitsu*, IBM*, Siemens*, Toshiba* and Unisys* are shipping or will ship Intel® Gigabit Ethernet technology as part of their products. Gigabit technology delivers the performance necessary to meet the requirements of customers faced with increasing network traffic from bandwidth-intensive applications, such as distributed databases, intranets and the Internet.

First PC-Based Video Phone for Cable Connections Showcased

Intel recently demonstrated the first PC-based video phone designed specifically for cable modems and high-speed cable Internet connections. The demonstration at the Western Cable Show reflected results from Initiatives of the Intel Architecture Labs (IAL) on Conferencing & Telephony and Broadband Communications. By using the power of the PC, the [Intel Video Phone](#) adds a high-quality, real-time video experience and telephony capability to cable connections.

PC Compliance

New Industry Group Formed – System Test Implementers Forum (IF)

The System Test Implementers Forum (IF) is a new group of industry system builders and PC platform developers working to review, and lead the industry-wide implementation of, Test Specifications, including compliance tests related to design guidelines defined in the PC 99 System Design Guide. The System Test-IF is sponsored by Intel Corporation and Microsoft Corporation, and is open to all developers who want to participate by providing their inputs during development of the PC Test Specification and related compliance tests. The Draft 0.1 release of the PC 99 Hardware Test Specification was released at the September, 1998 Intel Developer Forum and draft 0.3 is now available from the [System Test-IF Web site](#).

PC 99 Hardware Test Specification Review Event – Coming January 21

The PC 99 Hardware Test Specification review event will be held January 21, 1999 in Salt Lake City, Utah. Information about this event, membership in System Test-IF, and related draft specifications can be found at the System Test-IF web site. This review will feature interactive, technical walkthroughs of the individual PC 99 Hardware Test Specification chapters (ACPI, PCI, 3D graphics, and digital & broadcast video) with emphasis on discussion of industry feedback and key issues. The objective of this event is to encourage industry interaction and consensus around the draft 0.5 release of the PC 99 Hardware Test Specification. The intended participants for the review are engineers who build personal computers, expansion cards, and peripheral devices based on the design guidelines presented [in PC 99 System Design Guide](#).

USB

USB Sets World Record at Comdex – 111 Peripherals Attached to One Computer

Engineers from the Intel Architecture Labs helped the Universal Serial Bus Implementers Forum set a world record by connecting 111 peripheral devices to a single PC. [Staged live at COMDEX 98](#), the event demonstrated how easily consumers can plug in several devices to a USB port, and ultimately enjoy a more powerful computing experience.

Wired for Management

WfM Baseline Specification v2.0 Now Available

This new baseline specification builds on the existing specification to add management capabilities for desktop, mobile, and server systems. [Download the specification today](#).

Intel® Problem Resolution Software (PRS) Compatibility ToolKit Released

[Use this new toolkit to test](#) your problem resolution software's compatibility with the Service Incident Exchange Standard (SIS) Version 1.1 and Solution Exchange Standard (SES) Version 1.1, a recommended WfM Baseline v2.0 technology.

Intel Architecture Labs (IAL)

Talk n' Play* in Time for the Holidays

This holiday you can talk, tease, laugh and celebrate with friends while playing games online. [Download](#) a free pre-release of ThrustMaster's* new Talk n' Play during the month of December. Talk n' Play incorporates Intel® Multi-Point Audio software technology. Created within IAL's Conferencing and Telephony Initiative, Intel Multi-Point Audio technology enables consumers to keep pace with the game action and talk with up to three other players online at the same time.

Landmark Broadband Communications Proposal at FCC

Intel, together with other major computer and telephone companies, recently proposed to the Federal Communications Commission (FCC) a series of regulatory changes to accelerate the roll-out of high-speed Internet access for consumers. The [cross-industry proposal](#) offers guidelines to encourage rapid investment in high-speed data networks, while removing barriers telephone companies face to upgrade those networks.

“Revving the Web” Nets Recognition

In its December 1998 issue, “100 of the Year’s Greatest Achievements in Science and Technology,” [Popular Science magazine awards IAL](#) with “The Best of What’s New” for “Revving the Web.” *Popular Science* recognizes IAL’s Broadband Initiative efforts within the Universal ADSL Working Group (UAWG) to propel Asymmetric Digital Subscriber Line (ADSL) to increase Internet connectivity.

Policy-Based Network Management (PBNM) Gains Momentum

Customers will soon have a broader choice of network elements when implementing Policy-Based Network Management (PBNM). [HP OpenView* PBNM, based on IAL technology](#), will support heterogeneous networking environments by integrating with 3Com Transcend* Policy Management System, Cisco CiscoAssure*, FORE Systems ForeView* Policy Services, HP ProCurve* Switches, and Nortel Networks Optivity* Policy Services. Developed within the IAL’s Internet Media Initiative, PBNM technology provides the ability to define and distribute policies to manage heterogeneous networks.

Industry Events

Consumer Electronics Show (CES)

January 9, Las Vegas, NV

[Consumer electronics industry annual show](#) where all of the newest CE technologies are showcased.

DVD & DirectShow* Developer Days

January 11-12, Milpitas, CA

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Intel Developer Forum - Spring

February 23-26, Palm Springs, California

Registration is now open for [Spring IDF](#)! This is Intel's next big developer event in the U.S. which features in-depth technical presentations and demonstrations by Intel's chief architects on all Intel Architecture platforms from Business and Consumer Desktop, to Server, Workstation, Mobile, and Embedded. Register prior to January 21, 1999 and receive \$200 early bird discount! Stay tuned to *Platform Solutions* and the IDF web site for event information as it becomes available.

Game Developers Conference (GDC)

March 15-19, San Jose, CA

This is the [annual industry event](#) for developers who make entertainment software across all computing platforms.

Intel Networking Events & Training

For Intel's events and training programs on networking products and technologies, please visit [the Intel networking events page](#).

—End of Platform Solutions Issue 15—